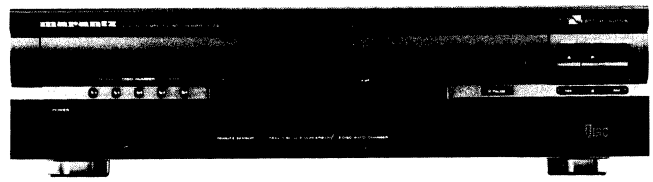
Service Manual

74 CC-52/01B/02B/05B/07B

Digital Compact Disc Changer



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marantz®

model CC-52

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PCS 67 230

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ company has created the ultimate in stereo sound.
Only **original MARANTZ parts** can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS:

Parts can be ordered either by mail or by telex. In both cases, correct part number has to be specified.
The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or telex must be signed otherwise such part order will be considered as null and void.

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Vestdijk 9
5600 MD Eindhoven
The Netherlands
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MARANTZ
700 NORTH COMMERCE STREET
AURORA, ILLINOIS 60504
U.S.A.
Phone : (708)820-4800
Telefax : (708)820-8103

PARTS ORDERING

Parts may be ordered at the following addresses:

AUSTRIA
HORNYPHON
Vertriebsgesellschaft GmbH
Wienerbergstrasse 1
A 1101 Wien
Austria
Telex: 132.332

BELGIUM
SVD DIVISION MARANTZ
Industrialaan 1
1720 Groot-Bijgaarden
Belgium
Telex: 24466

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DIVISION OF PHILIPS S.A.
AV. Santa Maria, 0760
Casilla 2687
Santiago
Telex: 240.239

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Denmark
Telex: 31201

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DIVISION OF OY PHILIPS Ab
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00100 Helsinki
Finland
Telex: 124811

FRANCE
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4 Rue Bernard Palissy
92600 Asnières
France
Telex: 611651

GERMANY
MARANTZ GERMANY GmbH
Alexanderstrasse 1
2000 Hamburg
Germany

THE NETHERLANDS
Elpro Marantz
Wint Hontlaan 28
3526 KV Utrecht
The Netherlands
Telex: 4748

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MARANTZ
DIVISION OF PHILIPS A/S
Sandstuveien 40
0680 Oslo 6
Norway
Telex: 72640

GREAT BRITAIN
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Unit 15/16
Saxon Way Industrial Estate
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Harmondsworth UB7 OLW
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Telex: 935196

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P.O.Box 21025
Hippocratus Street 188
Athens 11471
Greece
Telex: 216.795

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MARANTZ JAPAN, Inc.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

KUWAIT
AL ALAMIAH ELECTRONICS
Ussama Building
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P.O.Box 23781
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Telex: 22694

ITALY
MARANTZ ITALIANA S.P.A.
Via Chiese, 74
20126 Milano
Italy

SAUDI ARABIA
AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
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SOUTH AFRICA
MARANTZ
DIVISION OF PHILIPS S.A.
Main Road Martindale
P.O. Box. 58088
Newville 21114
South Africa

SPAIN
PHONO S.A.
Ignacio Iglesias 10
Badalona (Barcelona)
Spain
Telex: 59355

SWEDEN
MARANTZ
DIVISION OF PHILIPS
Försäljning AB
Tegeluddsvägen 1
S-115 84 Stockholm
Sweden
Telex: 14060

SWITZERLAND
MARANTZ
Technischer Service
Duenstrasse 3
3186 Düdingen
Switzerland

TURKEY
DOGRUOL Ltd.
I.M.C.
6 Blok N°6310
Unkapani
Istanbul
Turkey
Telex: 22085

MALTA
CACHIA & GALEA
Republic Street, 68D
Valetta
Telex: 1682

PORTUGAL
MARANTZ
Divisao philips S.A. service
Outurela-carnaxide
2795 LinDA-A-VELHA
Telex: 43906

CANADA
NORESCO
50 Wingold Avenue
Toronto, Ontario
Canada M6B 1P7

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

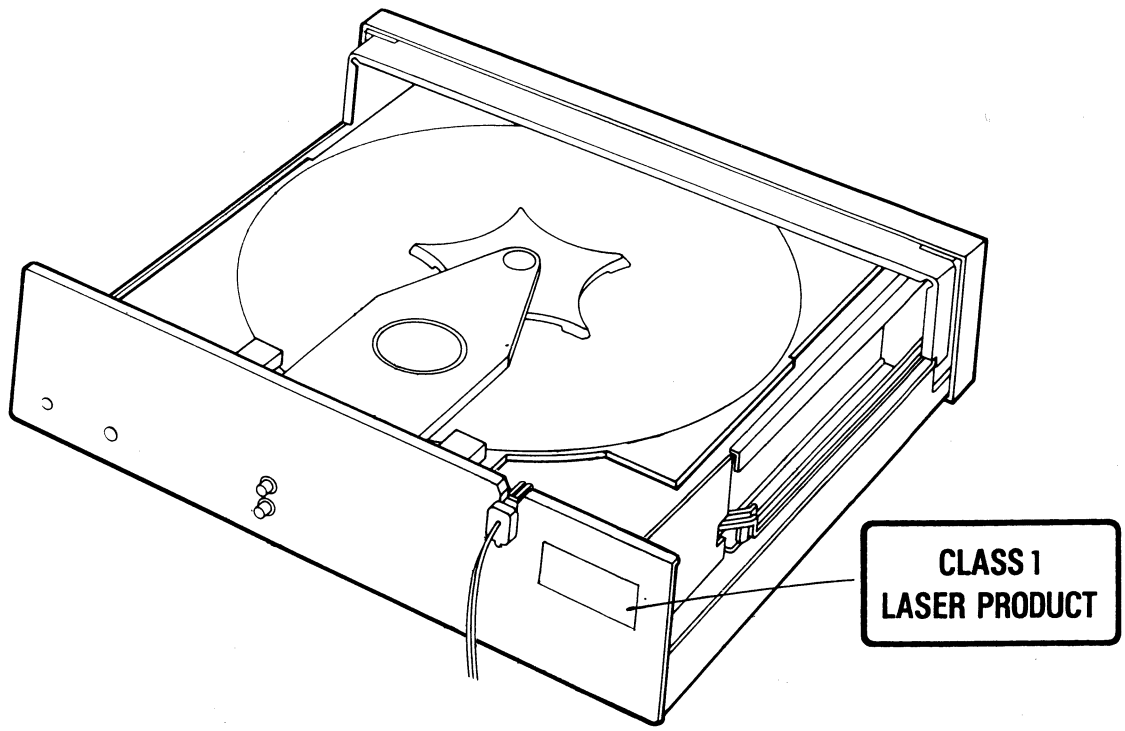
SHOCK, FIRE HAZARD SERVICE TEST:

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be reparied or corrected before AC power is applied, and verified before return to user/customer.
Ref. UL Standard NO. 1270. Para 74. 3. D (Mandatory Test after servicing Electrical Appliances, effective 7-1-83).

In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

SAFETY CERTIFICATION / CERTIFICAT DE SÉCURITÉ



DOC REGULATION

"THIS DIGITAL APPARATUS DOES NOT EXCEED THE CLASS B LIMITS FOR RADIO NOISE EMISSIONS FROM DIGITAL APPARATUS AS SET OUT IN THE RADIO INTERFERENCE REGULATIONS OF THE CANADIAN DEPARTMENT OF COMMUNICATIONS."

REGULATION DOC

"LE PRÉSENT APPAREIL NUMÉRIQUE N'ÉMET PAS DE BRUITS RADIOÉLECTRIQUES DÉPASSANT LES LIMITES APPLICABLES AUX APPAREILS NUMÉRIQUES DE LA CLASSE B PRESCRITES DANS LE RÉGLEMENT SUR LE BROUILLAGE RADIO ÉLECTRIQUE ÉDICTÉ PAR LE MINISTÈRE DES COMMUNICATIONS DU CANADA."

CAUTION– USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

ATTENTION– L'EMPLOI D'ORGANES DE COMMANDE OU DE RÉGLAGE, OU L'EXÉCUTION DE PROCÉDURES, AUTRES QUE CEUX SPÉCIFIÉS DANS LE MODE D'EMPLOI, PEUT PROVOQUER UNE EXPOSITION DANGEREUSE AU RAYONNEMENT.

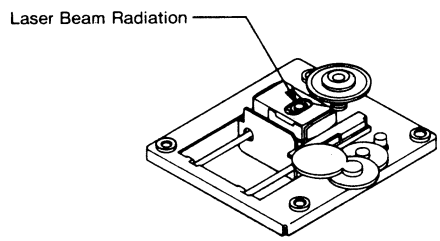
LASER SAFETY

This unit employs a laser. Only a qualified service person should remove the cover or attempt to service this device, due to possible eye injury.

SPECIFICATIONS

System	Digital Compact Disc Changer Drawer Type 5-disc Rotary Changer
AUDIO CHARACTERISTICS	
Frequency Response	5 – 20,000 Hz
Harmonic Distortion	Less than 0.003% (1 kHz)
S/N Ratio	More than 100dB
Wow and Flutter	Quartz precision
Channel Separation	More than 100dB (1 kHz)
Output Voltage max.	2Vrms
FUNCTIONS	
Disc Selection	with DISC NO. Buttons (1 – 5)
Track Selection	with MUSIC SKIP ▶▶I and I◀◀ buttons
Index Selection	with SEARCH/INDEX ▶▶ and ◀◀ buttons (normal mode only)
Forward/Back	2-Speed Search with sound
Each/Remain/ **Total Time Display**	with TIME button during PLAY mode
Program	32 selection
Repeat Tracks	One/All/Program
Program Reset	with CLEAR button
Checking Program	with RECALL button (in STOP mode)
Random Play (Shuffle Play)	with Remote Control
Intro Scan	with Remote Control
Pause	Each selection
Disc Loading	Front Loading
DIGITAL SIGNAL PROCESSING	
Optical Pickup	3-beam laser
Error Correction	CIRC
Sampling Frequency	44.1kHz
D/A Conversion	Bitstream
Filter	18 bits 8 times over sampling
GENERAL **Power Source**	/02 Version 230V, 50Hz /05/07 Version 240V, 50Hz /01 Version 110–120/220-240V, 50/60Hz
Power Consumption	20 Watts
Dimensions (W × H × D)	420 × 116 × 393.5mm
Weight	6.3kg

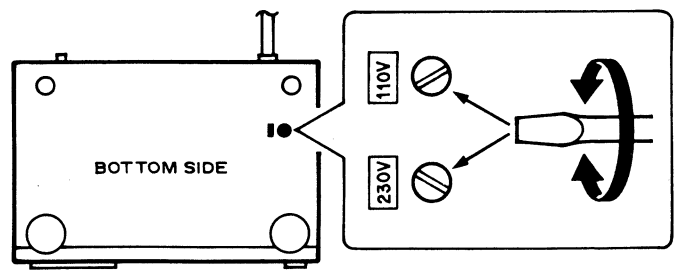
LASER BEAM RADIATION SPOT



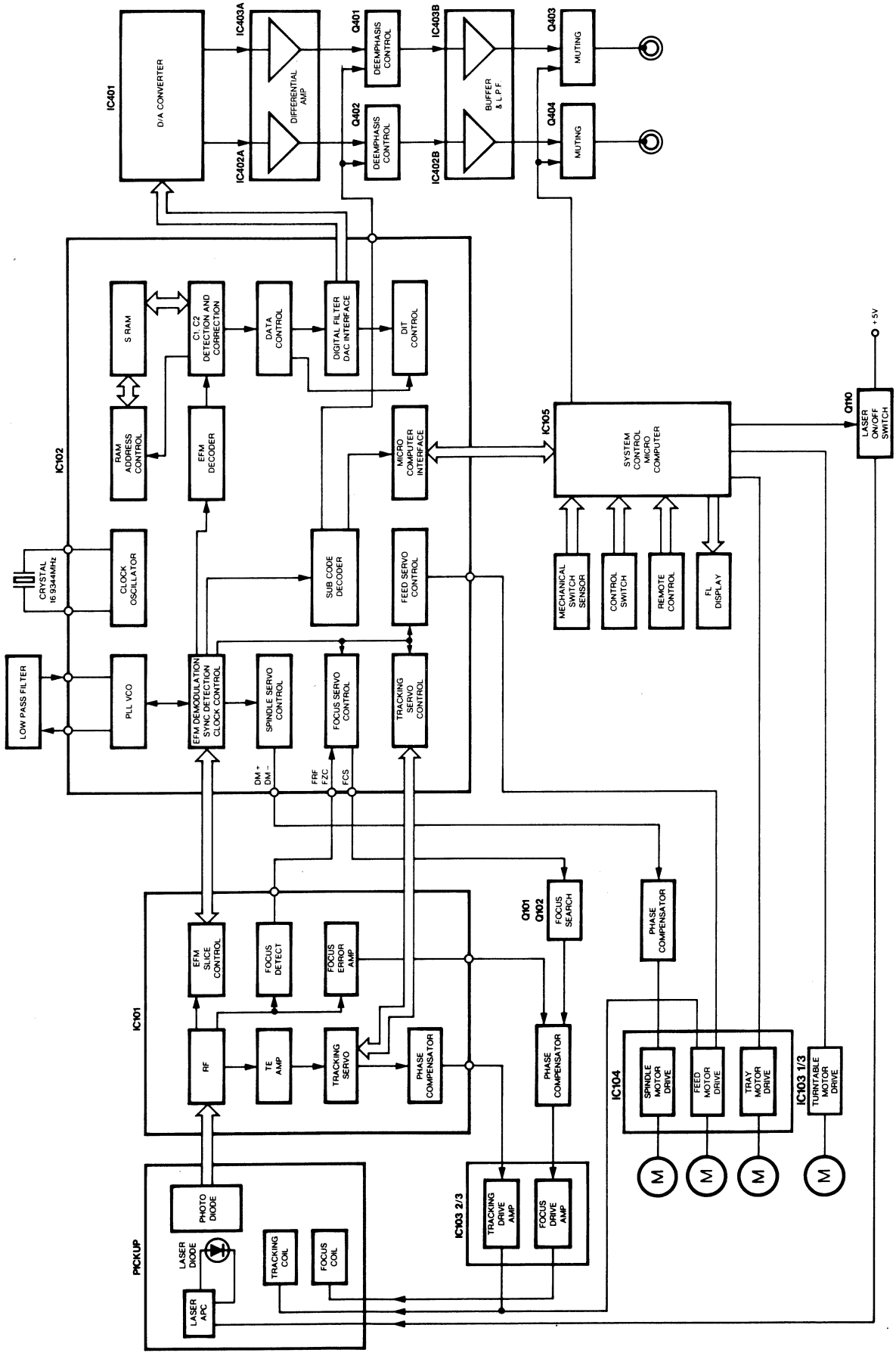
Laser Diode Properties
Material: Ga-Al-As
Wavelength: 755-815nm (25°C)
Laser Output: Continuous Wave max. 0.5mW

VOLTAGE CONVERSION

Voltage Conversion
(Only for Ever)
The voltage convertor is provided on the bottom plate of the unit. Please make sure that the voltage is correctly set for the area to export. If not, set ot cprrectly with reference to the right figure. Remove the power cord from the plug socket when setting the voltage.



FUNCTIONAL BLOCK DIAGRAM



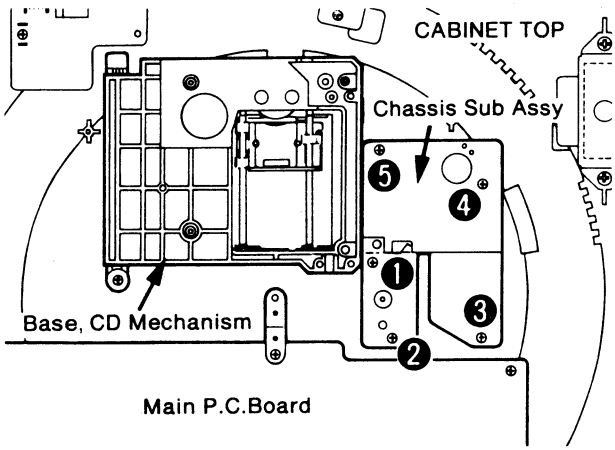
DISASSEMBLY INSTRUCITONS

GENERAL REMARKS

- Before disassembling the until, spread a soft rubber mat or a cloth on the workbench to avoid scratches and grease stains.
- Do not use a material which is likely to cause static electricity because transistors and ICs may be easily damaged by it.
- Reassemble the unit, noting the kinds of screws, the soldering and arrangement of the leads. Refer to "Circuit Diagram and Exploded Views" for correct assembly.
- Reassemble in reverse order.

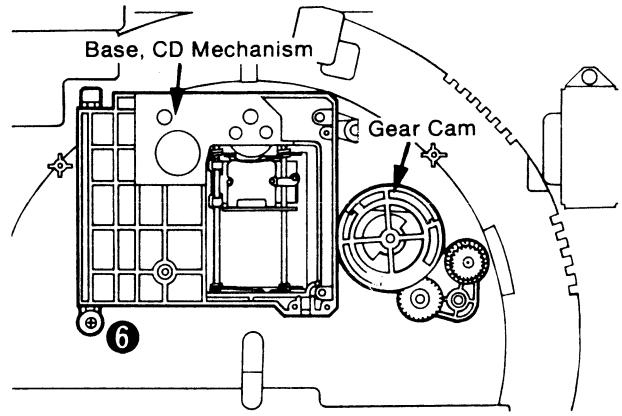
CHASSIS SUB ASSY REMOVAL

1. Turn the unit over on a clean soft surface.
2. Remove the screws from the Plate Bottom and detach the Plate Bottom from the unit .
3. Remove the five screws (1 ~ 5) fastening the Chassis Sub Assy to the Cabinet Top.
4. When installing the Chassis Sub Assy, fix it by screws in numerical order.
5. Reassemble in reverse order.

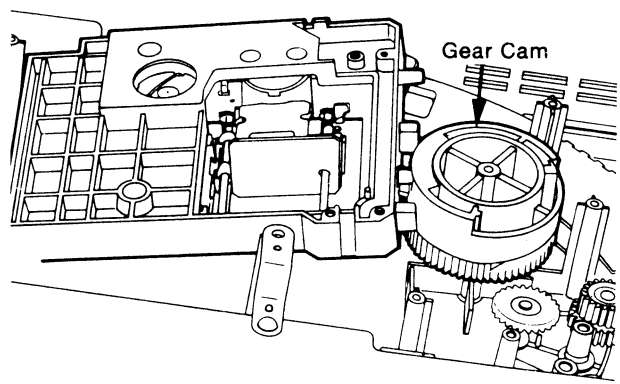


BASE, CD MECHANISM REMOVAL

1. Remove the Chassis Sub Assy by following the instructions for it.
2. Remove the screw (6) fastening the Base CD Mechanism.

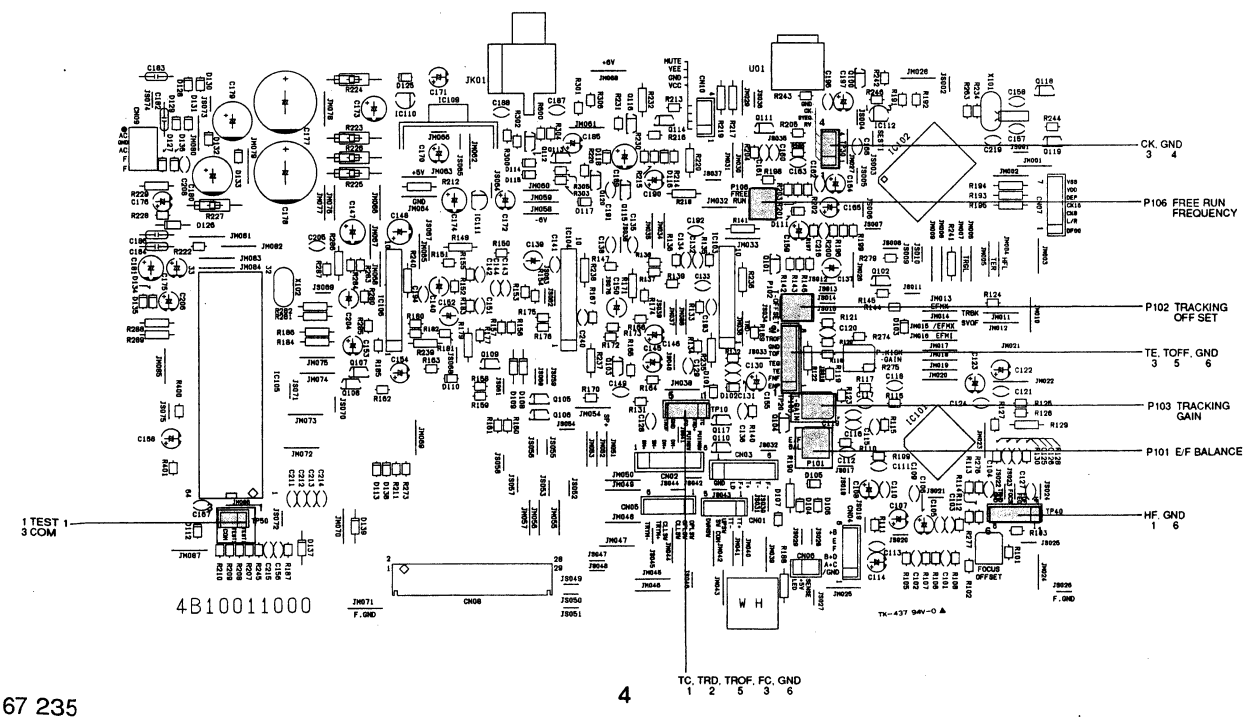


3. Remove the Base CD Mechanism taking out the movable boss from the up and down movable grove on the side of the Gear Cam.
4. Reassemble in reverse order.



P.C.BOARD ALIGNMENT POINTS

(TOP VIEW)



ADJUSTMENT PROCEDURES

BEFORE CHECKING OR ADJUSTING CD PLAYER

1. Procedures for all adjustments for the CD player from start to finish are described below.
2. If no problems are found after each item is checked when the pick-up is replaced, there is no need to adjust all items again.

SETTING OF INITIAL POSITION OF VOLUME

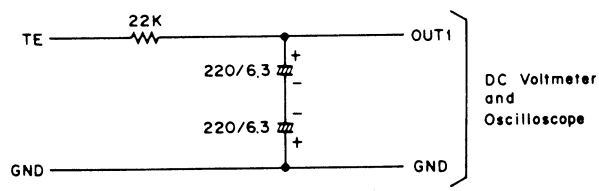
1. Set the variable resistors to the initial positions listed below:
   P101 (E/F BALANCE)·····Mechanical Center
   P102 (TRACKING OFFSET) ····· Mechanical Center
   P103 (TRACKING GAIN) ····· Mechanical Center
   P106 (FREE RUN FREQUENCY) ····· Mechanical Center

PLL (VCO) FREE RUN FREQUENCY ADJUSTMENT

1. Connect the frequency counter between the **VCO** test terminal **CK** and **GND**. (Use a 10: 1 Probe)
2. Push the POWER button to switch the power on and push the STOP button.
3. Adjust the P106 until the frequency counter indicator reads 4.32 MHz ~ 4.33 MHz.

E/F BALANCE ADJUSTMENT

1. Short the between test terminal **TEST1** and **COM** on the Main P.C.Board to the TEST mode.
2. Connect a DC voltmeter and an oscilloscope via the low pass filter like that shown in the illustration below to the test terminal **TE** (tracking error).
3. Place the test disc (Modern Wave Ⅱ) on the Disc Tray, and play the fourth item on the disc.
4. Short the test terminal **TOFF** to **GND** to turn the tracking servo OFF.



Measurement Circuit

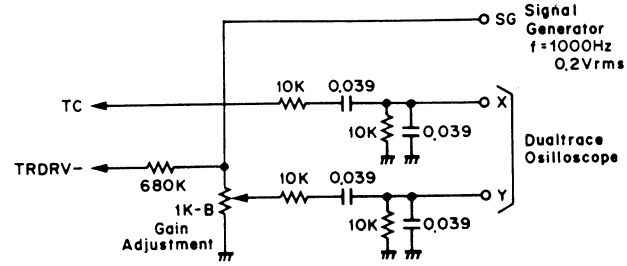
5. Adjust P101 so that the DC voltmeter reading is 0 V±50 mV (oscilloscope waveform is symmetric to + and − about the zero level).

CONFIRMING TE LEVEL

1. Play the fourth item on the test disc (Modern Wave Ⅱ).
2. Connect an oscilloscope to the test terminal **TE**, and check that its **TE** level is in the range at more than 2 V (P-P).
3. If the results of the above procedure are not satisfactory, the pick-up is damaged.

TRACKING GAIN ADJUSTMENT

The measurement circuit diagrammed below must be used i order to adjust tracking gain correctly.



Measurement Circuit

1. Apply P103 to the position of Mechanical center positior and place the test disc (Modern Wave Ⅱ) on the Dis Tray.
2. Connect the measurement circuit described in the las section to the test terminal **TC** (tracking coil) and **TRI** (minus). (Use 680kΩ Resistor)
3. Push the POWER button to switch the power on an PLAY the first item on the test disc. Now apply a signal c 1000 Hz and 0.2 Vp-p from the signal generator to th measurement circuit.
4. Set the oscilloscope to X-Y operation, and while observ ing the lissajous waveform adjust P103 to the point wher the phase difference is 90° as shown in Fig.1 below.

NOTE:
If these adjustments are performed, the TRACKING OFFSET must also be adjusted.

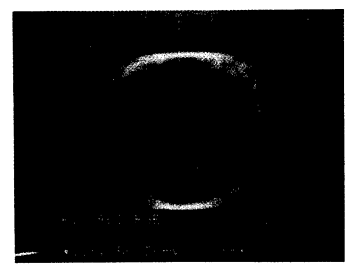


Fig 1.

CONFIRMING HF LEVEL & 3T JITTER VALUE

If no jitter counter is available, this check does not have t be performed.

1. Play the fourth item on the test disc (Modern Wave Ⅱ).
2. Connect an oscilloscope to the test terminal **HF** an check that its **HF** level is in the range 2.0 Vp-p ~ 3. Vp-p. (Use a 10: 1 Probe)
3. Connect a jitter counter to test terminal **HF** and chec that the 3T jitter value is less than 25 ns.
   (Window width: 600 ns ~ 850 ns, Set Level: 2.5 V)
4. Now play the tenth item on the test disc and check tha the jitter value is less than 25 ns again.

ADJUSTMENT PROCESURES (Continued)

TRACKING OFFSET ADJUSTMENT

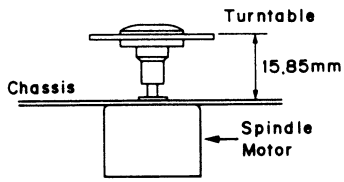
1. Push the POWER button to switch the power on and push the STOP button.
2. Connect a DC voltmeter to the test terminal **TC** (tracking coil) and short the test terminal **TROF** to **GND**.
3. In this condition check that the DC voltmeter indicator is in the range 100 mV±20 mV, and adjust P102 if it is not.

NOTE:
Perform this adjustment once again after adjusting the E/F BALANCE and TRACKING GAIN signals.

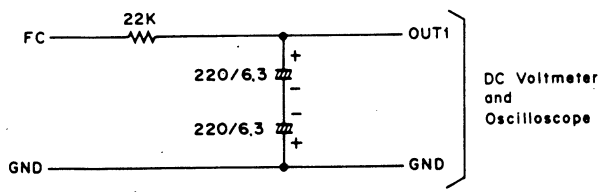
TURNTABLE HEIGHT ADJUSTMENT

This adjustment must be performed when the Spindle Motor is replaced.

1. The turntable should be mounted so that its upper surface is 15.85 mm ±0.1 mm above the surface of the chassis.



2. Place the test disc (Modern Wave Ⅱ) on the turntable.
3. Connect a DC voltmeter and an oscilloscope via the low-pass filter shown below to the test terminal **FC**.



Measurement Circuit

4. Push the POWER button to switch the power on and PLAY the First and Last Track No. on the disc.
5. If the DC Voltmeter reading is not in the ranges 0 V ±0.2 V for inner tracks and 0 V ±0.35 V for outer tracks, then the turntable height must be readjusted. Raise the turntable higher if the DC voltmeter indicator is on the plus (+) side, and lower it if it is on the minus (−) side. (With this circuit, 1V represents movement of approximately 0.55 mm ~ 0.65 mm).

SAFETY INTERLOCK

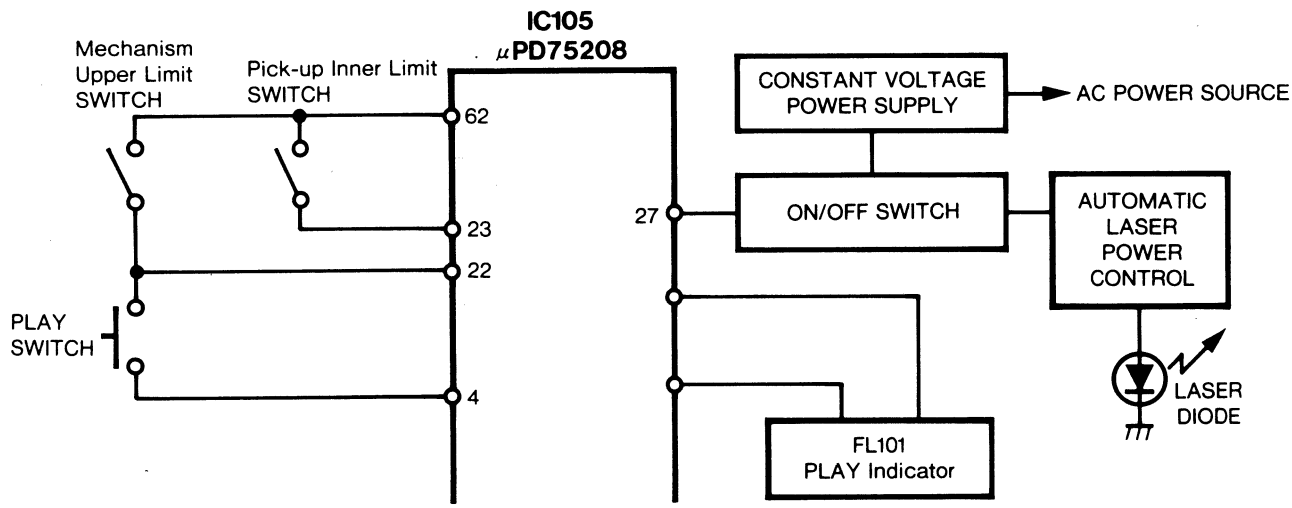
The Digital Compact Disc Player reads the disc signal by detecting the laser beam. It must be avoided for the human body to directly receive the beam. Especially human eyes are badly affected by the beam. Therefore, the unit is equipped with an interlock to prevent the unnecessary laser outputs.

The laser outputs are controlled by the injection or cutoff of the constant voltage source to the laser diode with Pin 27 of IC105 (μPD75208). When Pin 27 is in "L" (Low) level, the laser emits the beam. When Pin 27 is in "H" (High) level, the laser does not emit the beam.
Pin 27 is set in "H" level when the unit is loaded with the disc and it reads the index signals or when the unit is set in the play mode after that. When the unit reads the index signals and the following two conditions are met, the laser emits the beam.

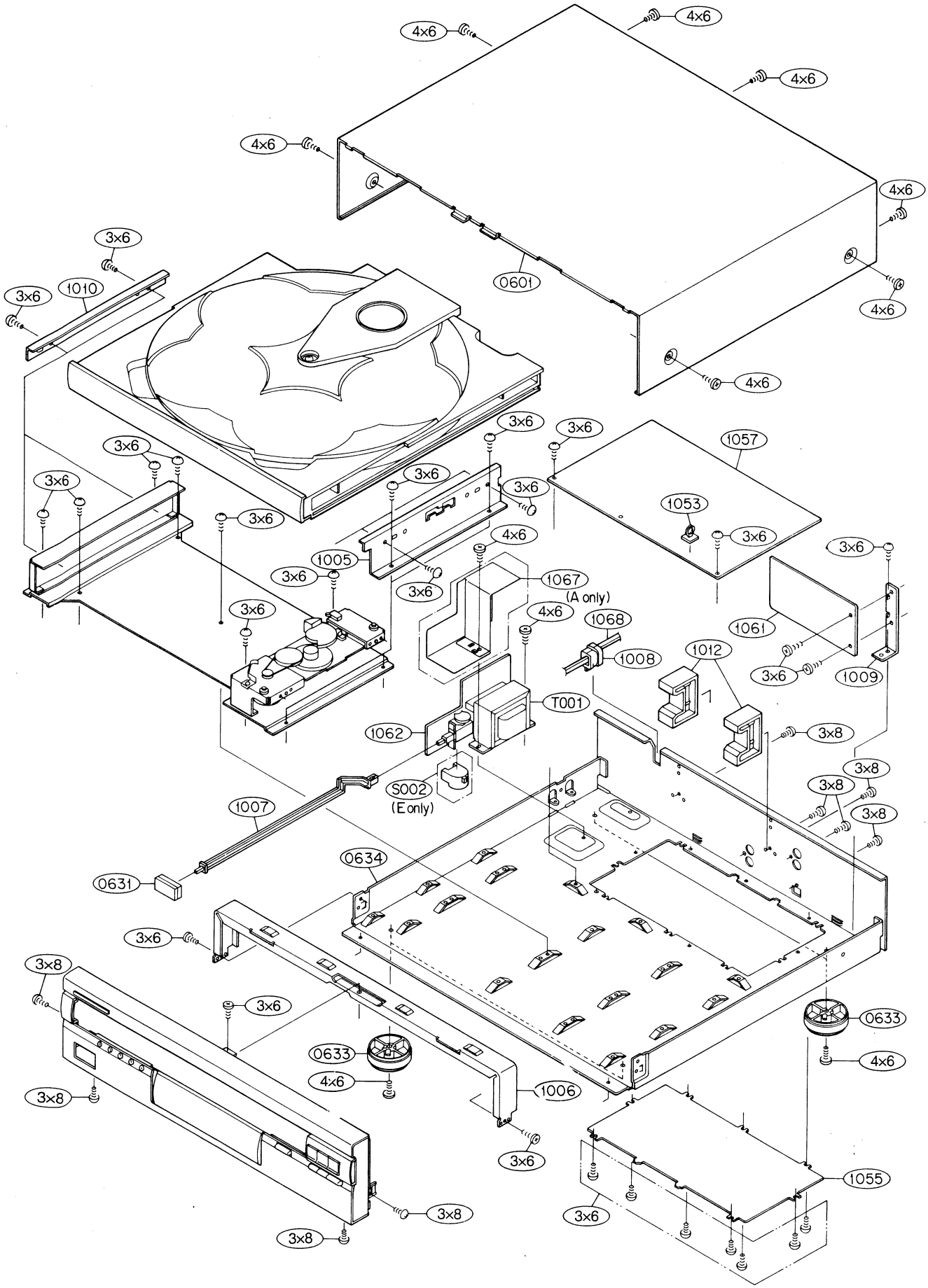
1) When the Mechanism Upper Limit Switch is on.
2) When the Pick-up Inner Limit Switch is on. (The disc tray is closed.)
3) The pickup is located at the area of the minimum internal circumference.

After the above conditions are met and the index signals have been read, the laser emits the beam when the following two conditions are met.

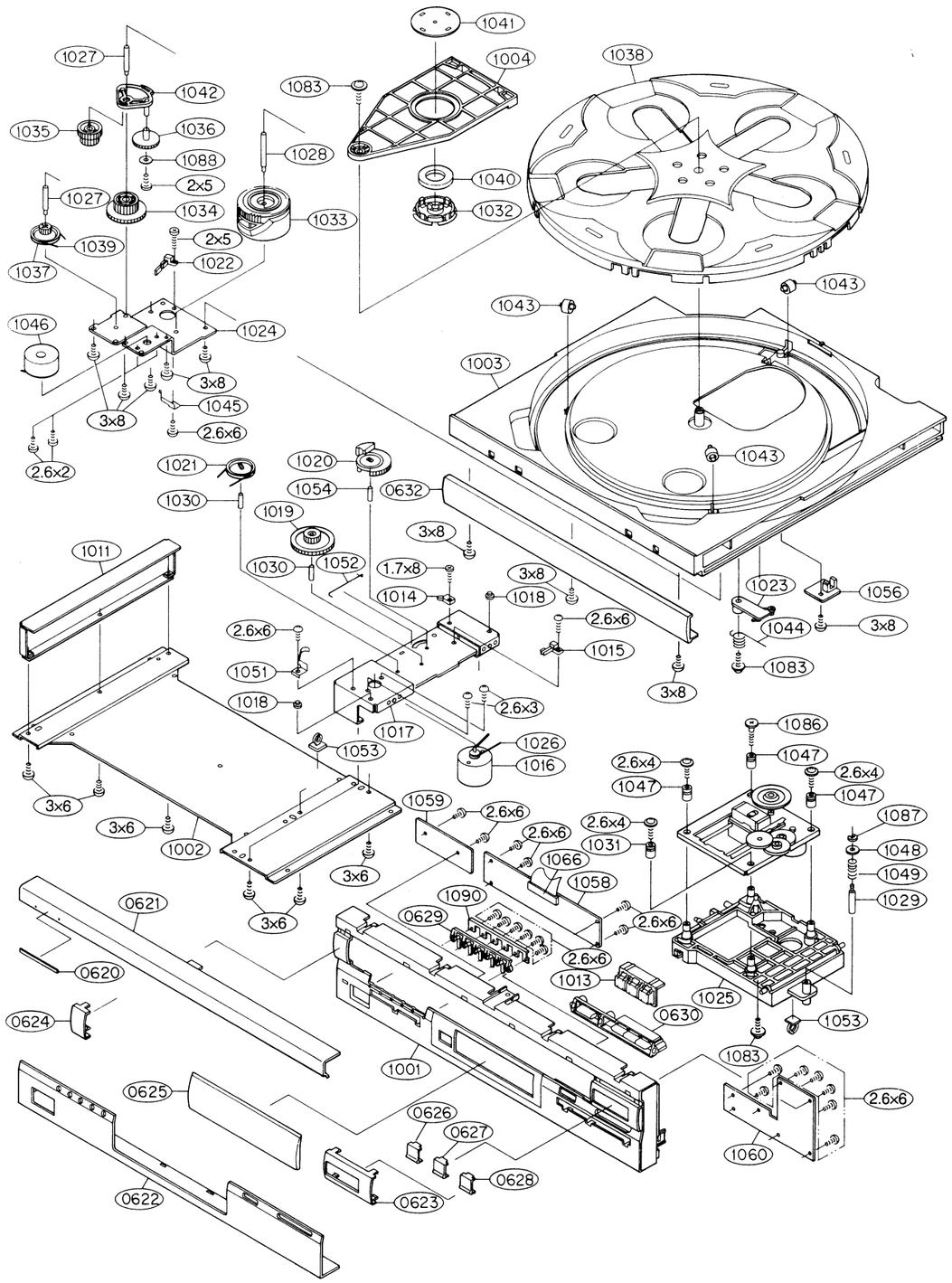
1) When the PLAY button is pressed.
2) When the PLAY indicator is on.



CABINET & CHASSIS EXPLODED VIEW (1)



CABINET & CHASSIS EXPLODED VIEW (2)

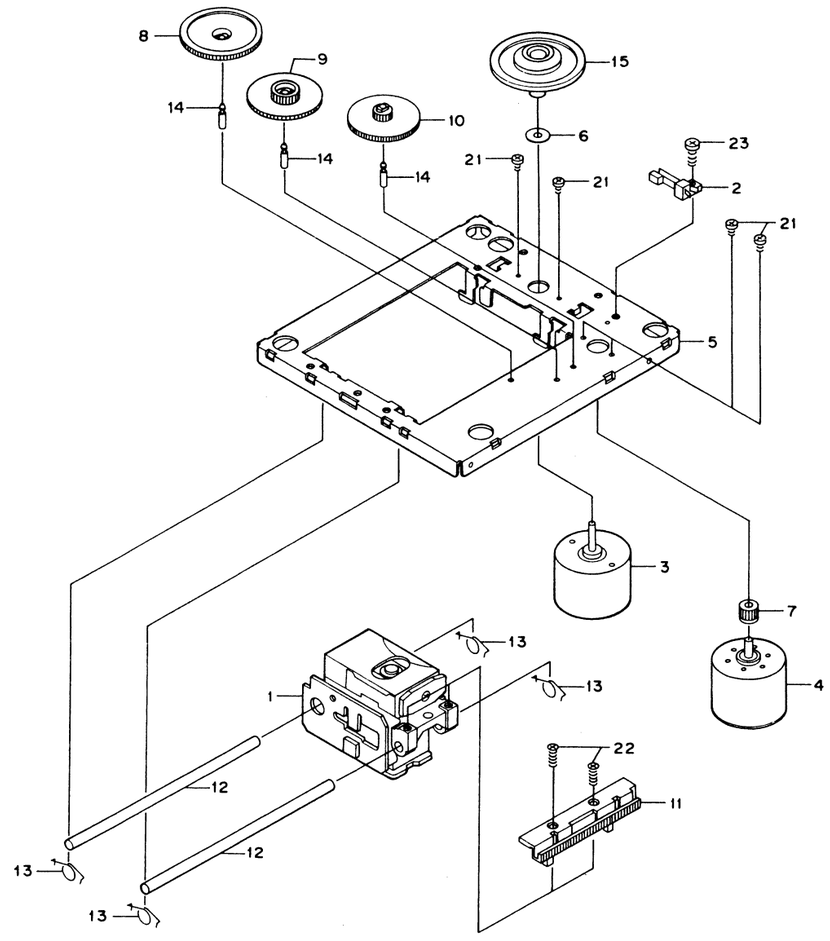


MECHANICAL PARTS LIST

REF. DESIG.	PART NO.	DESCRIPTION
0621	4822 444 40624	Front Panel
0622	4822 444 40625	Front Panel
0623	4822 444 40626	Front Panel
0624	4822 444 40627	Front Panel
0625	4822 450 61998	Window
0626	4822 410 62393	Button, (A)
0627	4822 410 62448	Button, (B)
0628	4822 410 62449	Button, (C)
0629	4822 410 62394	Button, Disc
0630	4822 410 62395	Button, Open
0631	4822 413 31724	Knob, Push
0632	4822 444 60893	Escutcheon, CD
0633	4822 462 41988	Leg
1001	4822 529 10287	Escutcheon
1003	4822 256 92009	Cabinet, Top
1004	4822 522 33321	Cover, CD
1007	4822 522 33322	Joint
1008	4822 522 33323	Bushing
1013	4822 522 33324	Button, Base
1014	4822 528 40355	Lever, SW
1015	4822 528 10867	Lever, SW
1016	4822 358 31236	D. C. Motor
1019	4822 444 60894	Gear, Load
1020	4822 444 30463	Gear, Return
1021	4822 444 60892	Pulley
1022	4822 402 61473	Switch, Leaf
1023	4822 532 12214	Lever, Assembley
1025	4822 410 62396	Chassis, Base CD
1026	4822 402 61474	Belt, Squear
1031	4822 402 61475	Damper
1032	4822 361 21594	Holder, Disc
1033	4822 522 33318	Gear, Cam
1034	4822 522 33319	Gear, Load
1035	4822 528 40354	Gear, Pinion
1036	4822 271 30793	Gear, Idler
1037	4822 402 61477	Pulley, Gear
1038	4822 464 50945	Turntable, Changer
1039	4822 358 31235	Belt, Squear

REF. DESIG.	PART NO.	DESCRIPTION
1040	4822 526 20205	Magnet, Disc Clamp
1041	4822 402 61472	Retainer, Magnet
1042	4822 402 61476	Lever, Change
1043	4822 528 90864	Roller, T. T
1044	4822 492 71263	Spring, Lever Lock
1045	4822 492 71266	Leaf Spring, Plate
1046	4822 361 21593	D. C. Motor, 6.0V
1047	4822 529 10288	Damper
1049	4822 492 71264	Spring, Damper
1051	4822 492 71267	Leaf Spring, Plate
1052	4822 492 71265	Spring, Wire
1066	4822 321 61817	Jumper Lead, Wire, 29P
⚠T001	4822 146 21704	Power Transformer/05B/07B
	4822 146 21705	Power Transformer/01B
	4822 146 21703	Power Transformer/02B
1083	4822 502 21279	Screw
1086	4822 502 21278	Screw
1087	4822 532 12215	RG Ring, E Type 02
1088	4822 532 12212	Washer
T100	4822 218 10491	IR Comander
001T	4822 736 21641	User Manual

MECHANISM EXPLODED VIEW



MECHANISM PARTS LIST

REF. DESIG.	PART NO.		
1	4822 691 30304	Mechanism	Pick Up Assy, 90EC2
2	4822 271 30794	Mini Switch	Leaf Swich
3	4822 361 21596	D.C. Motor	Motor
4	4822 361 21595	D.C. Motor	Motor
5	4822 532 12213	Washer	Special
6	4822 522 33325	Gear	Gear, Motor
7	4822 522 33326	Gear	Gear, Piniop

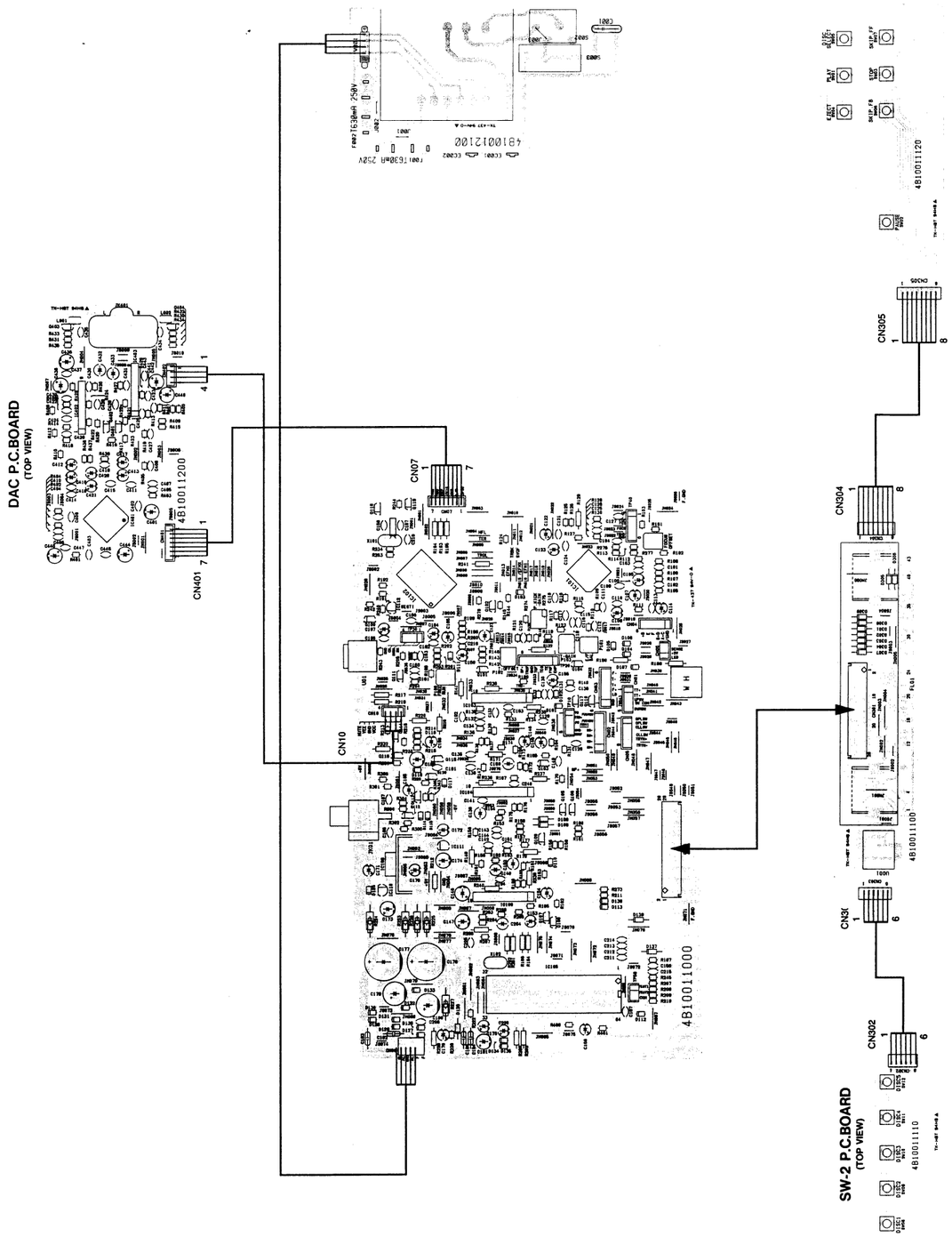
REF. DESIG.	PART NO.		
8	4822 522 33327	Gear	Gear, Load B
9	4822 522 33328	Gear	Gear, Load S
10	4822 522 33329	Gear	Gear, Rack
11	4822 492 42642	Spring	Spring, Tortion
12	4822 535 93359	Shaft	Spindle, Gear
13	4822 528 10868	Turntable	Turntable Assy

ELECTRICAL PARTS LIST

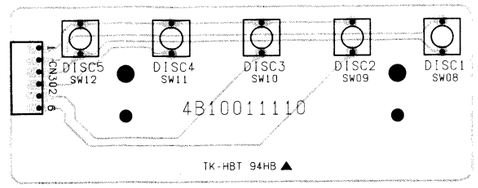
REF. DESIG.	PART NO.	DESCRIPTION
		MAIN CIRCUIT BOARD
		RESISTORS
⚠ R223	4822 116 60312	Resistor 4.7 Ω
⚠ R224	4822 116 60312	Resistor 4.7 Ω
⚠ R225	4822 117 10163	Resistor 0.47 Ω
⚠ R226	4822 117 10163	Resistor 0.47 Ω
		CAPACITORS
C177	4822 124 80403	Eilct Cap 3300 μ F/16V
C178	4822 124 80403	Eilct Cap 3300 μ F/16V
		SEMICONDUCTORS
D101 ~ D117	4822 130 83242	Diode GMB01-BT
D118	4822 130 83244	Zeher Diode GZS7.5Y-BT
D126	4822 130 83242	Diode GMB01-BT
D127	4822 130 83242	Diode GMB01-BT
D128 ~ D133	4822 130 83246	Diode ERA15 – 02, A3-I
D134	4822 130 83243	Zener Diode GZS24Z-BT
D135	4822 130 82641	Zener Diode GZS5.1Y-BT
D136 ~ D139	4822 130 83242	Diode GMB01-BT
IC101	4822 209 30154	IC LA9200NM
IC102	4822 209 31985	IC YM7121B
IC103	4822 209 71922	IC LA6510
IC104	4822 209 71922	IC LA6510
IC105	4822 209 31986	IC μ PD75208CW
IC106	4822 209 71922	IC LA6510
IC109	4822 209 73096	IC MC7805CT
IC110	4822 209 83819	IC NJM78L06A (T3)
IC111	4822 209 30442	IC NJM79L06A (T3)
IC112	4822 209 31988	IC PST523
Q100	4822 130 42871	Transistor 2SA608-F-NP-AA
Q101	4822 130 43822	Transistor 2SC3330-S
Q102	4822 130 43026	Transistor 2SA1346
Q103	4822 130 43319	Transistor 2SC3400
Q104	4822 130 43026	Transistor 2SA1346
Q105 ~ Q109	4822 130 43319	Transistor 2SC3400
Q110	4822 130 63193	Transistor 2SA1529
Q111	4822 130 43319	Transistor 2SC3400
Q112	4822 130 63196	Transistor 2SC536-G
Q113	4822 130 42871	Transistor 2SA608-F-NP-AA
Q114	4822 130 63195	Transistor 2SA1317-S
Q115	4822 130 43319	Transistor 2SC3400
Q116	4822 130 43822	Transistor 2SC3330-S
Q117	4822 130 43319	Transistor 2SC3400
Q118	4822 130 43319	Transistor 2SC3400
Q119	4822 130 43026	Transistor 2SA1346
Q120	4822 130 43319	Transistor 2SC3400

REF. DESIG.	PART NO.	DESCRIPTION
		MISCELLANEOUS
CN008	4822 265 51348	Plug, 29P
L001	4822 157 70289	Choke Coil 2.2 μ H
L002	4822 157 70289	Choke Coil 2.2 μ H
P101	4822 100 20552	Trimming Resistor 100K (B)
P102	4822 100 11954	Trimming Resistor 20K (B)
P103	4822 100 20552	Trimming Resistor 100K (B)
P106	4822 100 20552	Trimming Resistor 100K (B)
JK001	4822 290 81545	Terminal, RCA REM
U010	4822 265 31042	Converter, E/O
X101	4822 242 81356	Crystal
X102	4822 242 81355	Seramic Vib.
		DISPLAY CIRCUIT BOARD
		SEMICONDUCTORS
D301 ~ D309	4822 130 83242	Diode GMB01-BT
		MISCELLANEDUS
CN301	4822 265 51348	Plug, 29P
FL01	4822 130 91205	Display Unit CF1047CB
SW01 ~ SW12	4822 276 30417	Push Switch
U001	4822 209 31987	Photo Unit GP1U501X
		DAC CIRCUIT BOARD
		SEMICONDUCTORS
IC401	4822 209 30438	IC SAA7350
IC402	4822 209 73303	IC RC4558S
IC403	4822 209 73303	IC RC4558S
Q401 ~ Q404	4822 130 60948	Transistor 2SD1012-G
		MISCELLANEOUS
JK401	4822 290 81546	Jack, RCA 2P
		POWER CIRCUIT BOARD
		MISCELLANEOUS
⚠S002	4822 273 10262	Rotary switch/01B
⚠S003	4822 276 13351	Push Switch
⚠T001	4822 146 21704	Power Transformer/05B/07B
	4822 146 21705	Power Transformer/01B
	4822 146 21703	Power Transformer/02B

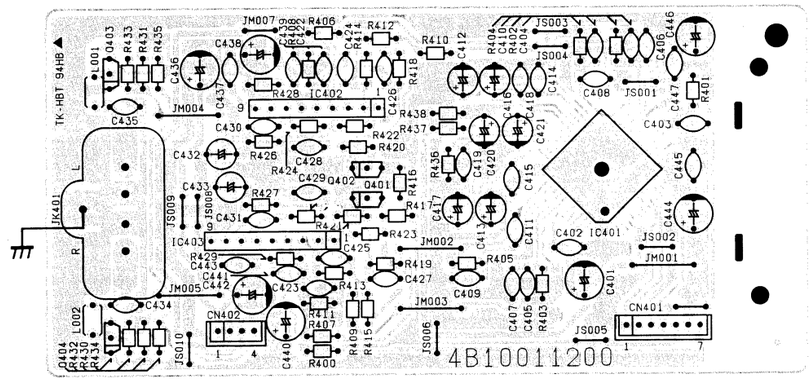
POINT TO POINT WIRING DIAGRAM



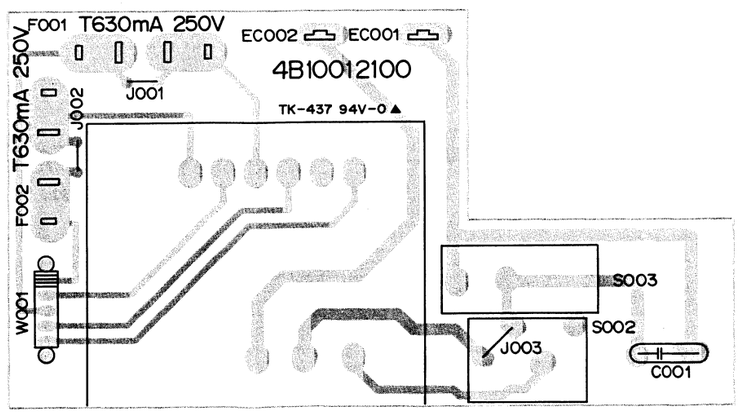
SW-2 P.C.BOARD
(BOTTOM VIEW)



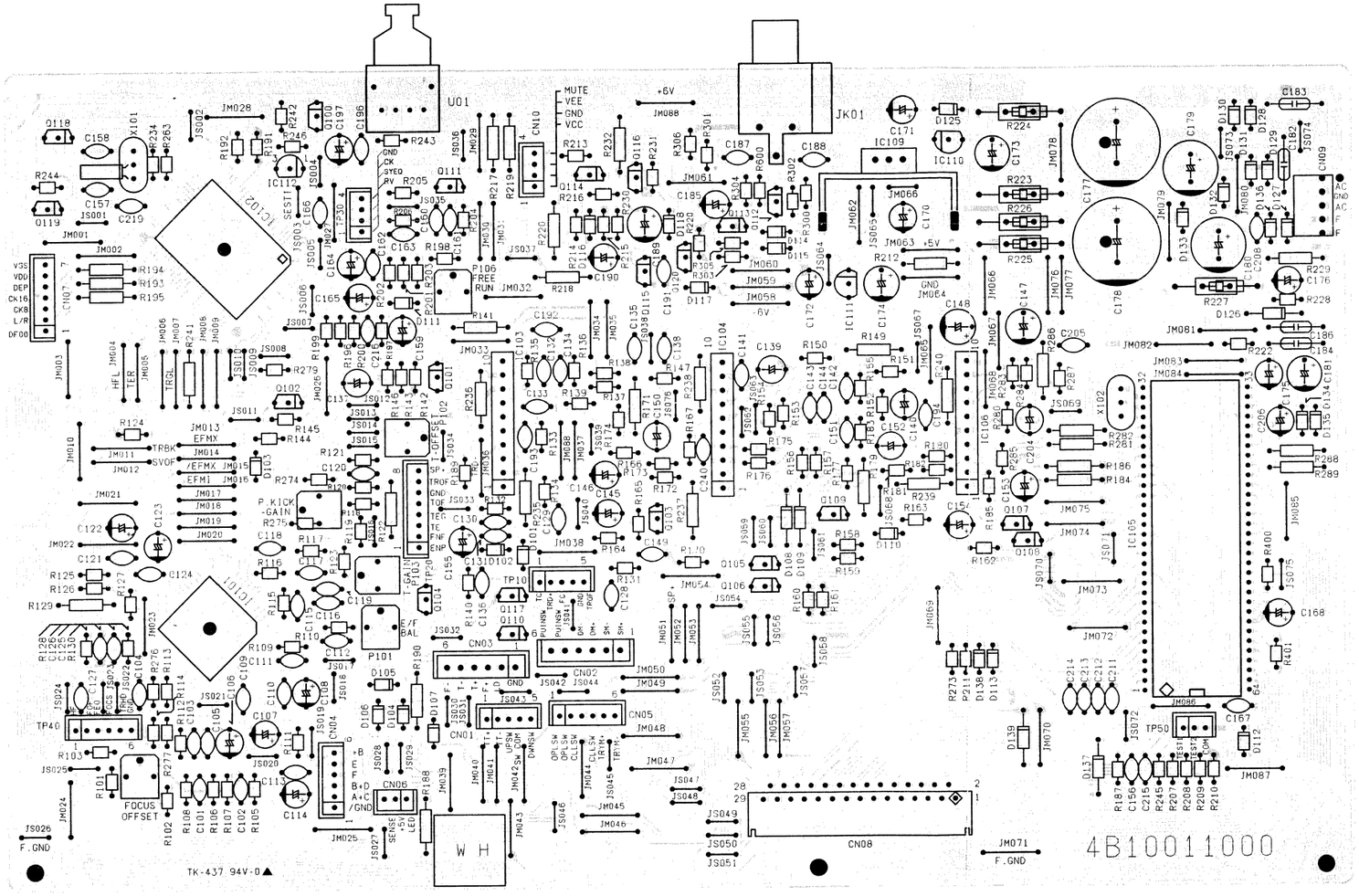
DAC P.C.BOARD
(BOTTOM VIEW)



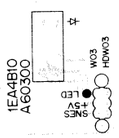
POWER P.C.BOARD
(BOTTOM VIEW)



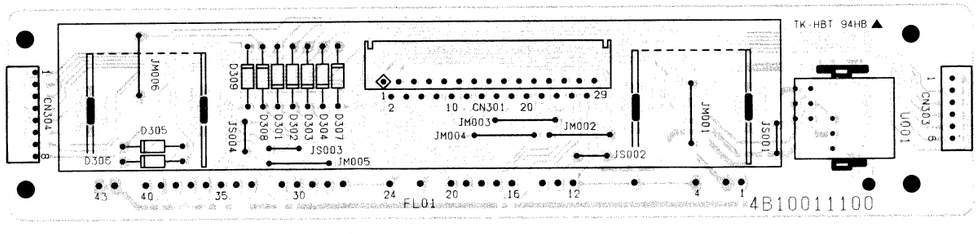
MAIN P.C.BOARD



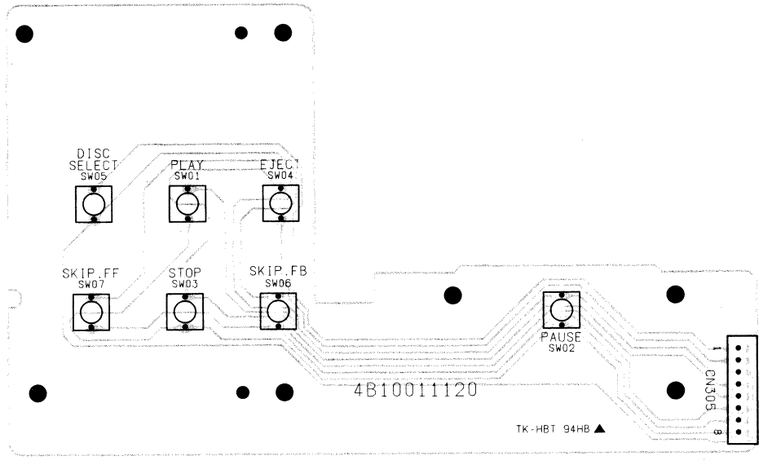
SENSOR P.C.BOARD
(BOTTOM VIEW)



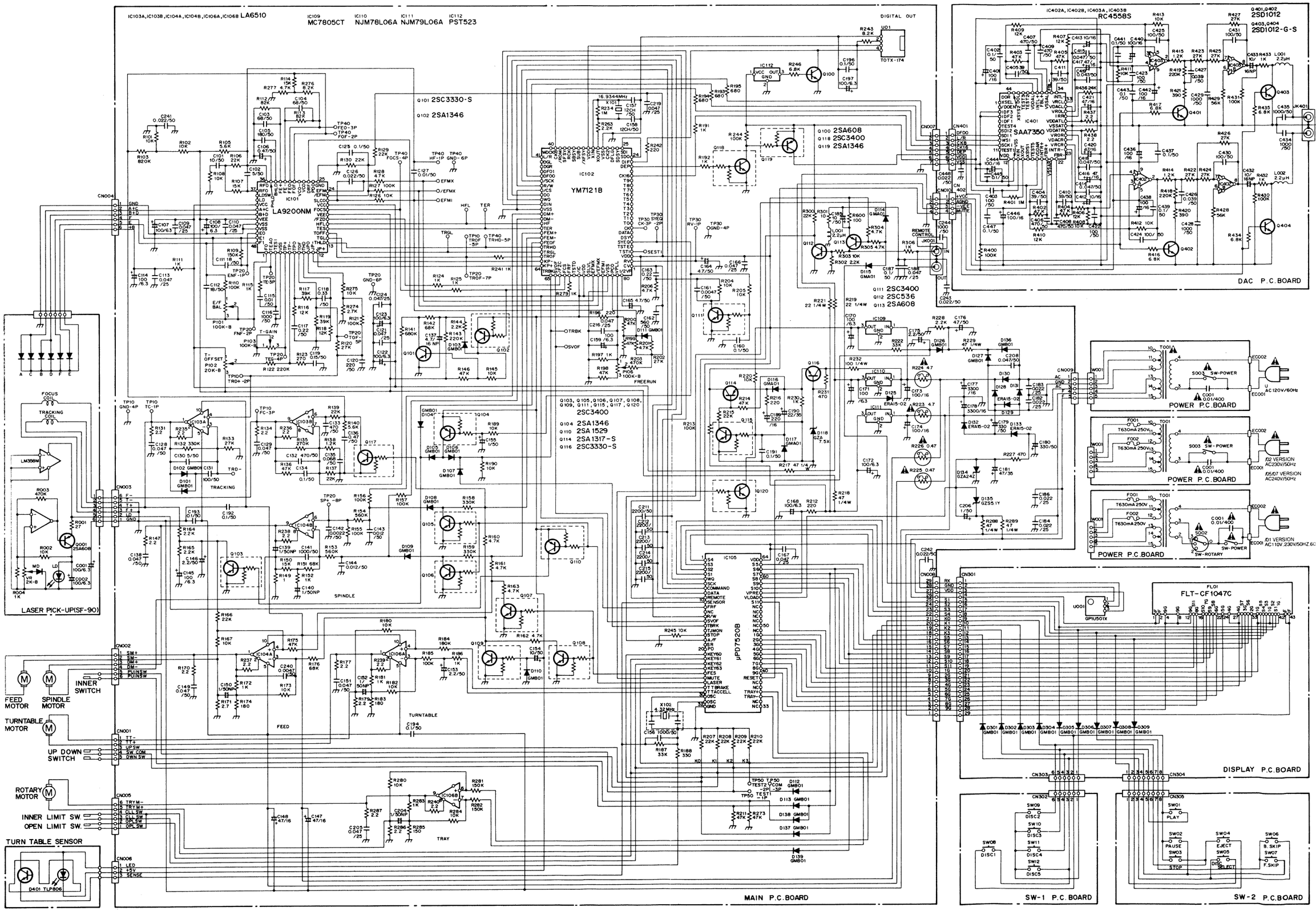
DISPLAY P.C.BOARD
(BOTTOM VIEW)



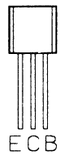
SW-1 P.C.BOARD
(BOTTOM VIEW)



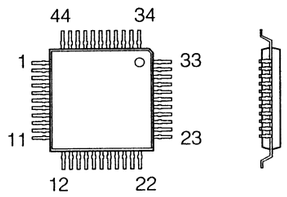
SCHEMATIC DIAGRAMS



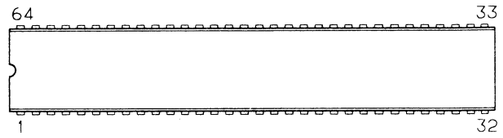
IC & TRANSISTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW	TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SA1529			2SA1317 2SA1346 2SC3330 2SC3400 2SD1012		
TERMINAL NAME					
B → BASE C → COLLECTOR E → EMITTER					

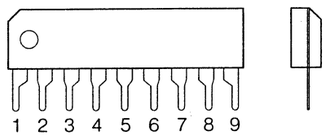
SAA7350 TOP/SIDE VIEWS



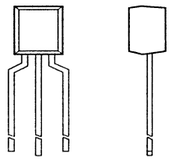
UPD75208CW TOP VIEW



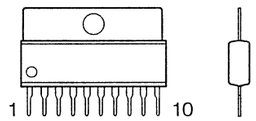
RC4558S TOP VIEW



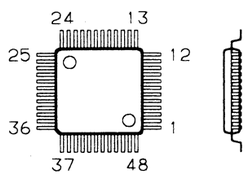
PST523C



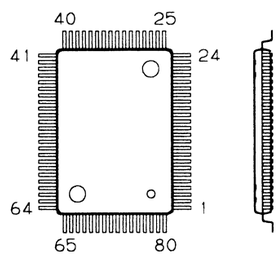
LA6510 TOP VIEW



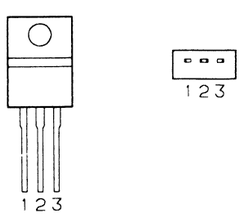
LA9200NM TOP/SIDE VIEWS



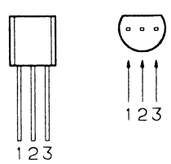
YM7121B TOP/SIDE VIEWS



MC7805CT FRONT/BOTTOM VIEWS

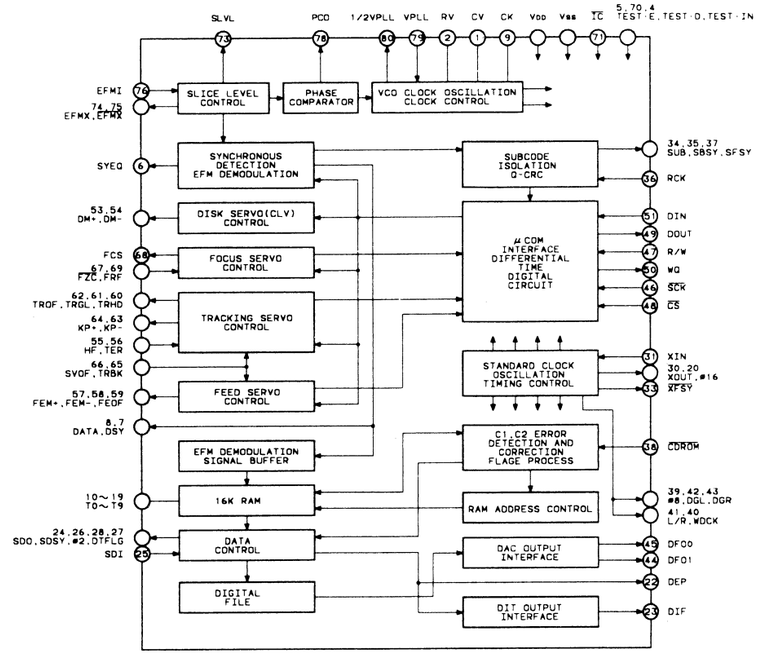


NJM78L06A(T3) FRONT/BOTTOM VIEWS
NJM79L06A(T3) FRONT/BOTTOM VIEWS

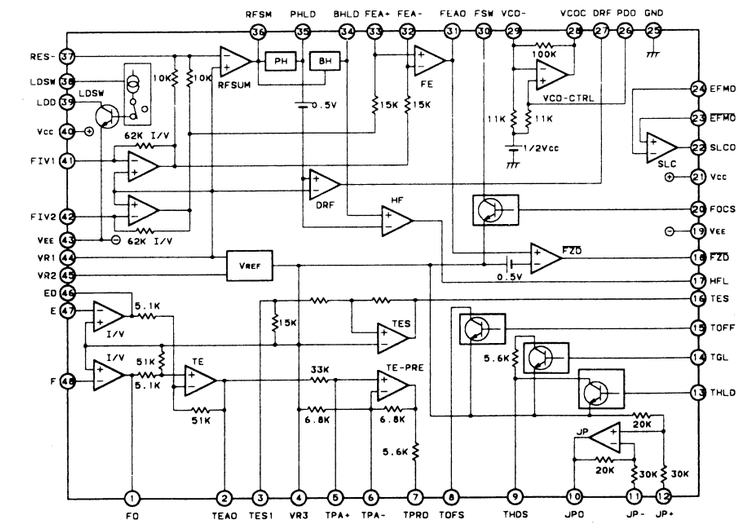


IC BLOCK DIAGRAM

YM7121B BLOCK DIAGRAM

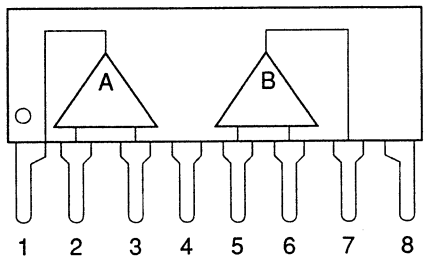


LA9200NM BLOCK DIAGRAM

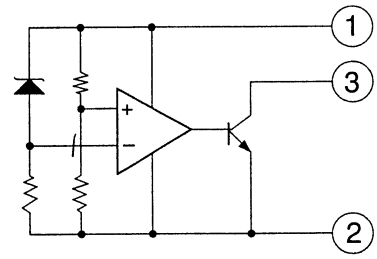


IC BLOCK DIAGRAM (Continued)

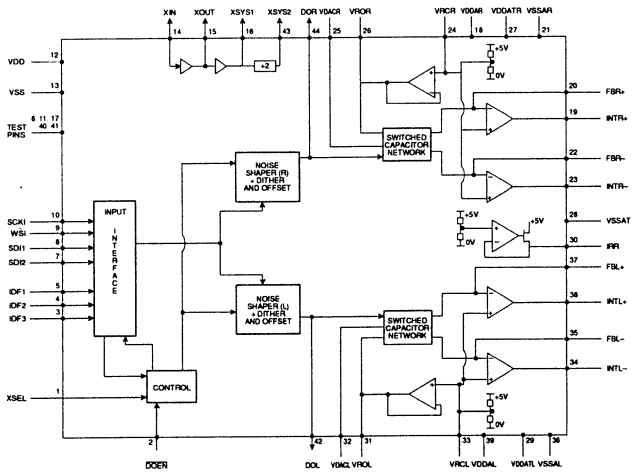
RC4558S BLOCK DIAGRAM



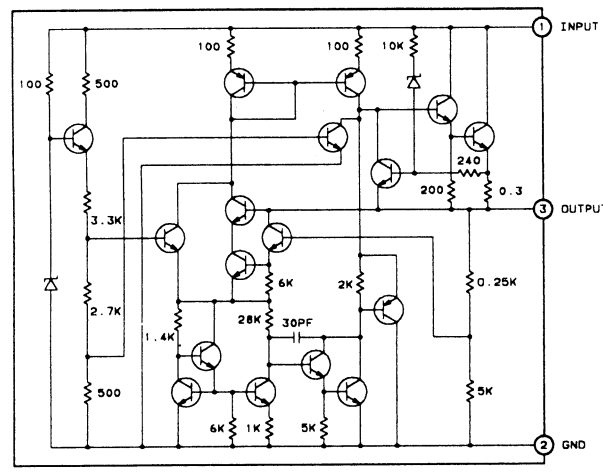
PST523C BLOCK DIAGRAM



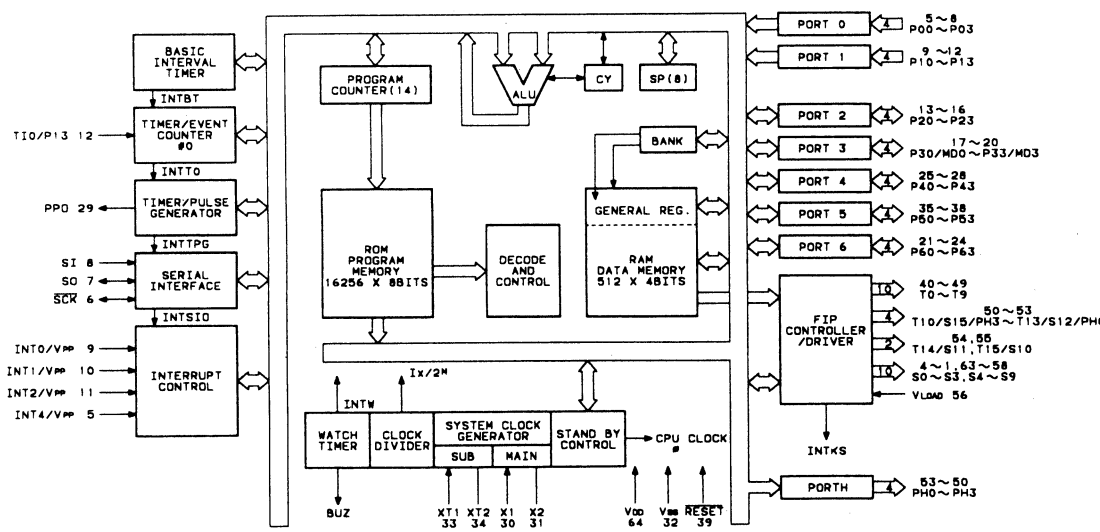
SAA7350 BLOCK DIAGRAM



MC7805CT BLOCK DIAGRAM

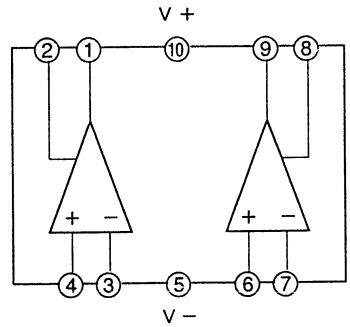


UPD75208CW BLOCK DIAGRAM

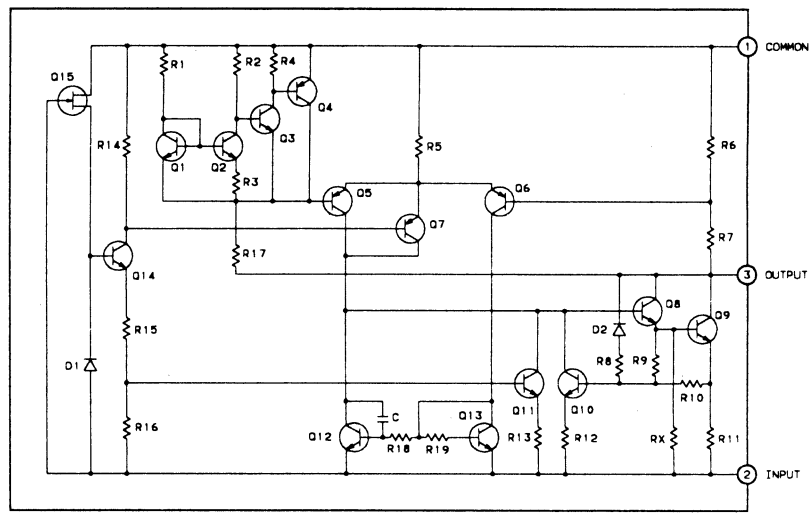


IC BLOCK DIAGRAM (Continued)

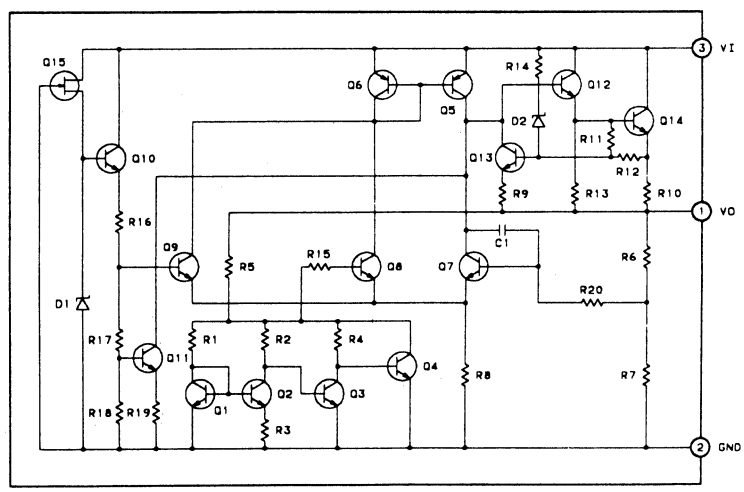
LA6510 BLOCK DIAGRAM



NJM79L06A(T3) BLOCK DIAGRAM



NJM78L06A(T3) BLOCK DIAGRAM



REFERENCE VOLTAGE

IC PIN NUMBER DC VOLTAGES																					
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IC101	LC9200NH	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	5V	4V	4V	4V	−5V	0V
		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
		5V	2V	3V	3V	0V	3V	0V	3V	3V	0V	0V	1V	1V	0V	0V	0V	0V	4V	0V	5V
		41	42	43	44	45	46	47	48												
		0V	0V	−5V	0V	0V	0V	0V	0V												

IC PIN NUMBER DC VOLTAGES																					
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IC102	YM7121	2V	3V	5V	5V	5V	0V	0V	1V	2V	5V	5V	5V	5V	5V	5V	5V	5V	0V	0V	2V
		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
		0V	0V	3V	0V	0V	3V	3V	0V	0V	2V	2V	5V	5V	0V	0V	0V	0V	5V	2V	3V
		41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
		3V	2V	2V	0V	0V	5V	0V	0V	0V	0V	0V	0V	0V	0V	4V	4V	0V	0V	5V	0V
		61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
		0V	5V	0V	0V	4V	5V	4V	0V	0V	5V	5V	5V	3V	3V	3V	2V	0V	2V	4V	2V

IC PIN NUMBER DC VOLTAGES											
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10
IC103	LA6510	0.7V	0V	0V	0V	−13.2V	−11.5V	−11.3V	−1.5V	1.5V	12V

IC PIN NUMBER DC VOLTAGES											
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10
IC104	LA6510	−1.8V	−1.8V	0V	0V	−13.2V	0V	0V	12.2V	12.2V	12.2V

IC PIN NUMBER DC VOLTAGES																					
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IC105	μPD75208	−26V	−13V	−2V	−13V	0V	5V	0V	0V	5V	5V	0V	0V	0V	5V	5V	0V	0V	0V	0V	5V
		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
		2V	2V	2V	0V	5V	0V	5V	0V	0V	2V	2V	0V	0V	5V	0V	0V	0V	0V	5V	−27V
		41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
		−27V	−27V	−27V	−27V	−27V	−27V	−27V	−27V	−30V	−30V	−30V	−30V	−30V	−30V	−19V	−30V	−6V	−23V	−20V	−30V
		61	62	63	64																
		−16V	−16V	−2V	5V																

IC PIN NUMBER DC VOLTAGES											
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10
IC106	LA6510	−1.8V	−1.8V	0V	0.2V	−13.2V	0V	0V	2.5V	−2.5V	12.6V

IC PIN NUMBER DC VOLTAGES				
SYMBOL No.	DEVICE	1	2	3
IC111	NJM79L06	−6V	−11V	0V

IC PIN NUMBER DC VOLTAGES				
SYMBOL No.	DEVICE	1	2	3
IC109	MC7805CT	11V	0V	5V

IC PIN NUMBER DC VOLTAGES				
SYMBOL No.	DEVICE	1	2	3
IC110	NJM78L06	11V	0V	6V

IC PIN NUMBER DC VOLTAGES																					
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IC405	SAA7350	5V	5V	0V	0V	5V	5V	5V	0V	3.2V	2.7V	0V	5V	0V	1.9V	2.5V	2.9V	0V	5V	2.6V	2.6V
		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
		0.4V	2.6V	2.6V	2.6V	0.4V	2.6V	5V	0.4V	5V	2.6V	2.6V	0.4V	2.6V	2.6V	2.6V	0.4V	2.6V	2.6V	5V	5V
		41	42	43	44																
		5V	0V	3.6V	0V																

IC PIN NUMBER DC VOLTAGES																					
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IC401	SAA7350	5V	5V	0V	0V	5V	5V	5V	0V	3.2V	2.7V	0V	5V	0V	1.9V	2.5V	2.9V	0V	5V	2.6V	2.6V
		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
		0.4V	2.6V	2.6V	2.6V	0.4V	2.6V	5V	0.4V	5V	2.6V	2.6V	0.4V	2.6V	2.6V	2.6V	0.4V	2.6V	2.6V	5V	5V
		41	42	43	44																
		5V	0V	3.6V	0V																

IC PIN NUMBER DC VOLTAGES										
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9
IC402	RC4558S	2.6V	2.4V	2.5V	1.4V	1.0V	0.6V	2.3V	2.3V	2.5V

IC PIN NUMBER DC VOLTAGES										
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9
IC403	RC4558S	2.5V	2.4V	2.5V	1.4V	1.0V	0.6V	2.3V	2.3V	2.5V